I. Project Title and Purpose Statement

Project Title: Greening our Gardens – Urban Growing Strategies for Climate Resiliency

Project Purpose: The Regional Environmental Council, Inc. (REC) seeks to utilize its extensive grassroots community connections and 40-plus years of experience working to foster environmental justice initiatives in the city of Worcester (MA) to launch an educational project for urban gardeners to promote use of gardening practices that can be used to increase climate resiliency; including carbon sequestration, efficient water use, and storm water run-off prevention. This project will be called Greening our Gardens – Urban Growing Strategies for Climate Resiliency and will work in Worcester's low-income neighborhoods. Greening our Gardens project activities will educate gardeners on these practices via community workshops, implement these practices through intensive support at four community gardens, and build sustainability through the creation of a resource guide for the network of 60+ community and school gardens supported by the REC. The project will impact gardens across the city, but resources will be focused in Worcester's five lowest-income/highest-risk neighborhoods. It builds on the successful 20 year history of the REC's Urban Garden Resources of Worcester program (UGROW) community gardens network. UGROW coordinates a growing network of over 2,000 community and student gardeners at 62 urban gardens, 20 of which are located within public schools. Together these gardens produce over 15,000 pounds of food annually. It will also be informed by expert partners including the Massachusetts Chapter of the Northeast Organic Farming Association (NOFA/Mass) and the University of Massachusetts Stockbridge School of Agriculture.

STATUTES

This project includes activities authorized by the Clean Air Act, Section 103(b)(3). By training local Worcester urban growers to store carbon in the soil and increase their efforts towards climate resiliency, the project will ensure the promotion of community health and welfare, raise awareness, and build local capacity to address climate change.

II. Environmental and/or Public Health Information about the Affected Community

Worcester has a population of 181,045 (Census 2010) making it the 2nd largest city in New England after Boston. 23% of families with children in Worcester live below the poverty level, 72% of Worcester's public school children are eligible for free or reduced cost lunch, and 16% of households are on food stamps (US Census 2010). For single families headed by single females, this figure jumps to 60% (U.S. Census Bureau American Community Survey, 2005-2009). Over 63% of public school students are low-income, versus the statewide average of 28.9% (Census 2000). The city has been burdened by an array of poor environmental conditions over the years combined with a lack of access to healthy food and green space. Once thriving industrial complexes, for example, are now extremely toxic Brownfield sites; the City of Worcester's Technical Services Department has identified more than 1,000 Brownfields in Worcester in recent years. Diesel exhaust pollution has led to poor air quality in the city as well.

In addition to an increased burden of environmental pollution and blight, Worcester's lowest income populations feel the impact of food insecurity in a real way. 57% of people requesting

emergency food from local food pantries in Worcester are children and their parents, and over 72% of Worcester's public school children are eligible for free or reduced-cost lunch. In the city's 14 lowest-income census tracts where REC focuses its work, 1 child in 3 lives in a family unable to meet its basic need for food, and 32% of mothers surveyed who were not living in shelters (i.e., not homeless women) stated there were days in the last month when family members went without food (Rachel's Table, 2011). In addition, and paradoxically, obesity has also become a significant impediment to good health in Worcester, as 27% of the population in Worcester is obese (as of 2010) and 35% more are overweight.

UGROW is a grassroots-organized project to initiate, stimulate and support the growth and vitality of community gardens in the city's low-income neighborhoods and at the public schools. Established in 1995 with just 5 gardens, 62 gardens are in the network now (including 25 educational gardens). They are tended by over 500 volunteer gardeners and over 1,500 school children are involved in the school gardens program. All gardeners grow an array of organic produce annually, to share with their families, friends, neighbors and schools. The vast majority of our community and school gardeners are people of color, and many are recently arrived immigrants and refugees from a diverse array of countries, including Burma, Bhutan, Iraq, Haiti, the Dominican Republic, Albania, Russia, Vietnam, Ghana, and Liberia. We will concentrate our efforts in this project on the 5 low-income Worcester neighborhoods in which REC focuses its work. These neighborhoods fall within the definition of "Environmental Justice Communities" and also correspond to the city's federally designated Neighborhood Revitalization Strategy Areas (NRSAs), which results in their bearing a disproportionate share of the impact of these conditions. Two of these neighborhoods (Piedmont and Main South) are the most densely populated in the city, have the highest percentages of ethnic and racial diversity, the lowest income, and the highest crime rates in the city (Downs & Ross, 2003).

While the REC has extensive experience doing grassroots work to address environmental toxins and food insecurity locally, the UGROW network's primary focus has been building community, green space, and increasing food security. This project will represent a new strategy that addresses climate resiliency through growing food. While global warming will affect everyone, studies have shown that existing inequalities are consistently amplified through current policies, making the burden more severe for low income Americans and people of color, particularly African Americans (*A Climate of Change: African Americans, Global Warming, and a Just Environmental Policy for the US*, Environmental Justice and Climate Change Initiative & Redefining Progress). Climate change will also impact issues of food poverty as fuel and food prices increase and access to local produce becomes more critical. Urban communities generate at least 40% of global greenhouse emissions through their physical growth, development, and the activities of inhabitants, but also have tremendous capacity for climate resilience if they choose to develop in a resilient fashion (www.accrn.org). In light of this, Greening our Gardens is a natural fusion of short and long term interests for our target population. UGROW gardens will continue to increase food access via food production, but, with our new education initiative, will also become more efficient in their use of resources while developing their capacity to reduce carbon levels in our community.

The project we propose here will benefit the community in several ways: (1) Its education and training components will impart information regarding efficient water usage, alternatives to

pesticides, and carbon sequestration to all participants in the UGROW network (2,000+). Participants will receive information and training directly via workshops as well as gain access to a new host of written resources describing low or no costs strategies to increase the environmental benefits of the gardens. (2) REC and community garden coordinators will strengthen and develop relationships with key partners working towards similar climate goals including NOFA/Mass and UMass Stockbridge School of Agriculture. (3) Four sites will receive intensive technical support and resources to make infrastructure improvements with an eye towards efficient water usage, stormwater run-off prevention (where appropriate), organic growing techniques, and carbon sequestration techniques including low or no-till growing and use of cover crops. This support will increase overall sustainability of the garden as a whole as well as providing demonstration sites for other growers. (4) Finally, the reduced carbon, use of commercial pesticides, and stormwater run-off will positively impact the long term environmental health of the communities where the gardens are located and increase our city's overall climate resiliency.

III. Organization's Historical Connection to the Affected Community

Regional Environmental Council, Inc. (REC), a grassroots, non-profit organization founded in 1971, is a private, non-profit environmental justice organization whose mission is to educate and empower communities within Central Massachusetts around the environmental issues threatening our region, and also to support residents to take action to bring changes to promote healthy, sustainable and just communities. Over the 43 years of our existence, our members, volunteers, staff, and board have organized and advocated for initiatives that foster environmental and social justice, ensure ecological sustainability and equitable access to clean air and water, open space, local, organic and nutritious food, clean energy, green jobs, and healthy homes, schools, workplaces and neighborhoods. We are committed to the concept that some of the most powerful changes begin close to home with local, grassroots work. One of REC's greatest strengths is our meaningful connection to the communities in which we work. Our successes have been made possible through our commitment to working hand in hand in a consensus manner with our neighbors to develop local solutions addressing the root causes of environmental justice problems, and to create change through community empowerment and leadership building. REC's primary programs are:

Environmental Health & Justice Program (EHJ), which addresses the environmental conditions that negatively impact Worcester's most vulnerable residents and families. EHJ initiatives include: *Weatherize Worcester,* which encourages residents to weatherize and make their homes more energy efficient; *Worcester Diesel Pollution Solution,* a campaign to reduce diesel pollution in the city; *Worcester Trash Action,* which coordinates a citywide trash cleanup effort every Earth Day and smaller neighborhood-focused cleanups throughout the year, and the *Worcester Green and Healthy Homes Coalition (WGHHC),* a coalition involving 35-member organizations coordinated by the REC that works to eliminate environmental health hazards in homes while simultaneously improving energy efficiency.

Food Justice Program (FJ), which focuses on connecting urban and rural sectors of the food system, developing entrepreneurial food projects at the grassroots level, and supporting urban agriculture. The Food Justice Program includes three projects: UGROW, YouthGROW, and the REC Community Farmers Markets. YouthGROW (Youth Growing and Raising Organics in Worcester) employs 34 low-income teens to gain leadership skills as they maintain two urban organic farms. The REC Community Farmers Markets project, which currently includes the

Main South Saturday Farmers Market, the Beaver Brook Monday and Friday Market, and the Mobile Market with 16 stops around the city on Tuesdays, Wednesdays and Thursdays, connects Worcester's lowest-income, food insecure areas with affordable, healthy produce from local farms. UGROW coordinates a network of over 2,000 community and school gardeners and 62 urban community gardens and is the focus of this request.

UGROW was established in 1995 with just 5 gardens, and has grown to include 62 in 2015. UGROW is designed and implemented in partnership with the community gardeners. Each year, UGROW is modified based on the feedback of 62 Community Garden Coordinators who complete end-of-season written evaluations, as well as attend an appreciation dinner. Neighborhood residents and community gardeners also provide project guidance at UGROW's annual Spring Garden Festival & Plant Sale, in particular by identifying future projects they would like to be part of. The project coordinator is a Worcester native and graduate of one of the Worcester Public Schools and has been trained in community organizing. The REC has an organizational commitment to community empowerment and utilizes consensus based decision making whenever possible. UGROW's model in particular hinges on developing the capacity of volunteer Garden Coordinators to lead and manage the gardens long term with the UGROW coordinator providing technical expertise and support only as needed.

To sustain our relationship with the community gardeners, our UGROW coordinator meets with them several times a year. Each fall, staff conduct site visits at each community and school garden. During the visit, Garden Coordinators share highlights and challenges from the previous growing season, select workshops that interest them, list projects and support needed during the coming year, and have a chance to share stories and produce from their garden. During the winter, we host an annual appreciation dinner for the gardeners. The dinner is an appropriate time to reflect on the previous growing season, share stories, receive feedback, and connect and enjoy good food. During the early spring, the UGROW Coordinator contacts Garden Coordinators regarding their annual seedling and compost orders. In the spring, community and backyard gardeners attend the annual Spring Garden Festival & Plant Sale to pick up and purchase seedlings.

UGROW works to increase community awareness regarding high lead levels in the soil, share expertise regarding various urban growing methods, and increase the amount of fresh produce consumed. In 2014, we reached 1,250 participants through 35 educational workshops and events. When surveyed regarding behavioral changes that may result from participation in the UGROW Community Gardens Network, 83% feel more involved in their neighborhood. 96% eat more fruits and vegetables, and all of the community gardeners surveyed agreed that they have gained new gardening skills as a result of working in the garden. In the past we have focused on partnering with community gardeners to build healthy soil via practices that increase soil nutrients and decrease erosion. We have not yet had an intentional focus on climate stability. Based on the level of interest in soil health among community gardeners, we are excited to expand our programming with a focus on climate stability.

We have a strong foundation developing local solutions to address the root causes of environmental justice problems and creating change through community empowerment and leadership building. As a result of our meaningful connection to the communities in which we

work and our commitment to working hand in hand with our neighbors, we are well positioned to build on these successes and move on to the next step. This project will further that work by educating and empowering members of Worcester's low income communities and community based organizations with an increased knowledge base and thereby increasing the capacity of these individuals and groups to address the environmental health hazards confronting them.

IV. Project Description

The goals of the Greening our Gardens project are to educate and empower low-income community gardeners to increase local climate resiliency by: (1) cultivating and training a cadre of low-income community garden coordinators in the many low-cost steps urban growers can take to reduce the negative environmental impacts of urban growing and increase the positive benefits; (2) retrofitting four high-need community gardens with infrastructure improvements designed to decrease water waste and increase carbon sequestration; (3) creating long term resources around strategies urban growers can use to address climate change via print resources to be distributed electronically/annually and the creation of four demonstration garden sites. REC will be the lead agency in this project and will utilize our established relationships of trust within our constituency to coordinate the workshop series and garden support. Technical expertise will be provided by the University Of Massachusetts Stockbridge School Of Agriculture, and the Massachusetts Chapter of the Northeast Organic Farming Association (NOFA/Mass).

(1) *Stockbridge School of Agriculture*. We have grown our relationship with the Stockbridge School of Agriculture since 2012. Since 2011, they have worked with urban growers across the state as part of an overall systems approach to provide fresh produce to urban populations. As part of this work they are also evaluating the carbon footprint used to produce and transport fresh produce to urban settings. They have supported us by growing seedlings for our annual plant sale, conducting soil tests and subsequent analysis at various community garden sites, presenting workshops focused on soil health, and advising us on how to enhance our greenhouse growing methods. They will provide support in piloting the four part workshop series focused on strategies that urban growers can use to increase climate resiliency, and developing a plan to support four community gardens with community organizing and infrastructure improvements.

(2) *The Massachusetts Chapter of the Northeast Organic Farming Association (NOFA/Mass)*. NOFA/Mass is a community of farmers, gardeners, landscapers and consumers. They work to educate members and the general public about the benefits of local organic systems based on complete cycles, natural materials, and minimal waste for the health of individuals, communities, and the living planet. They offer educational events and conferences, policy analysis and advocacy, technical assistance and access to resources, and outreach and marketing. They work extensively with beginning farmers, as well as with many farmers who are seeking to expand their operations by transitioning to organic production and pursuing new markets through innovative marketing and distribution practices. They have also committed to concentrating on agriculture and land management as a response to climate change. They have the resource to connect us with farmers that are practicing techniques that store carbon in the soil. They will also support us in piloting the four part workshop series focused on strategies that urban growers can

use to increase climate resiliency, as well as provide technical assistance in developing print resources.

Greening our Gardens work towards the following objectives:

Objective 1: Provide four part workshop series
The REC will work with Frank Mangan, Extension Associate from the Stockbridge School of Agriculture, and Glenn Olivera, NOFA/Mass Education Director, to develop and pilot a four part educational workshop series focused on strategies that urban growers can use to increase climate resiliency. These partners have a high level of expertise both in climate resiliency related to agriculture and in workshop development. REC will use its relationship with the community gardens network to coordinate promotion for this series with a target of 20 attendees per workshop, as well as managing all logistics and scheduling. Each workshop presenter will receive an honorarium and support planning the workshop from the coordinator to ensure material is presented in an accessible and relevant format.

Objective 2: Develop print resources for long term use
The REC will develop written resources on low/no-cost garden techniques that urban gardeners can use to store carbon and build organic content in the soil. Staff from NOFA/Mass will provide technical assistance in developing the print resources. Final products will include (1) a printed brochure that will be distributed to all 62 garden coordinators along with their annual informational packet; (2) 4 lesson plans aligned with MA STEM curriculum objectives for use in school gardens with a focus on how to build climate stability through urban gardening; and (3) creation of an online resource packet that will be published via the REC website describing relevant gardening practices and local resources.

Objective 3: Support four existing gardens to become demonstration sites
The REC will work with four community garden sites to strengthen their capacity to sustainably grow food. The first phase of the grant will be spent assessing the gardens with the highest need and the capacity and interest to participate in this intensive component of the project. Phase two will be used to plan infrastructure improvements in collaboration with the coordinator to address garden needs and preserve water and soil resources i.e. rainwater collection systems, drip irrigation, and tree plantings. Phase three/growing season will be spent working closely together to practice sustainable growing techniques with a strong focus on carbon sequestration for fall. The stages of the grant cycle will be spent evaluating and determining next steps for utilizing the garden as a demonstration site for other members of the network.

Objective 4: Project Evaluation
Evaluation of these new program components will be critical in ensuring the sustainability of this project. As such, we will utilize a variety of measures including pre and post surveys before and after workshops to measure participant's knowledge changes, qualitative assessments of new resources from local partners including garden coordinators and schools, and focus groups with the four community gardens who receive intensive support. In addition to this, the UGROW Coordinator will host a community gardeners forum open to all 62 volunteer coordinators to gain feedback on the gardens as a whole as well as the impact of new program elements. Lastly, the UGROW Coordinator will conduct one-on-one post-season site visits with all gardens during the

fall to assess their needs and determine where more support is needed. Quarterly and final reports will be written and submitted to the EPA by the REC.

In sum, the Greening our Gardens initiative proposed here by the Regional Environmental Council will provide vital education, knowledge, skills and empowerment to residents of Worcester's low-income communities so that they can become change agents on their own behalf and take important steps toward improving the climate resiliency of our community and begin to redress some of the environmental inequities they and their neighborhoods have endured.

TIMELINE

Objective 1: Provide four part workshop series			
Activity	**Output**	**Outcome**	**Timeline**
1. Assemble team of experts presenters utilizing partnerships with UMass Extension & NOFA/Mass	Gain commitments from a minimum of 1 professional presenter per workshop to co-develop and deliver workshops	REC strengthens partnerships with local experts in the field of urban agriculture and climate resiliency	September/October 2015
2. Schedule & promote workshop series	Plan dates & locations for all workshops, create outreach material, begin contacting gardeners via direct mail, phone, and internet	Awareness and enthusiasm for workshop series is generated amongst network	October 2015
3. Implement Workshops	Offer workshops in collaboration with expert presenters, reach a minimum of 80 participants	Community members are educated on the impacts of climate change and the steps they can take to increase Worcester's climate resiliency through gardening	November 2015, January 2016, May 2016, June 2016
Objective 2: Develop print resources for long term use			
1. Meet with organizational partners and presenters to determine relevant content for print	Create list of key concepts and techniques to share within network	Key partners agree on core list of concepts and techniques to include in material for different level of constituents including beginning growers	October/November 2015

and web material		(online), students (lesson plans), and experienced growers (Garden Coordinators)	
2. Design brochure, 4 lesson plans aligned with MA learning standards, and an online guide that includes straightforward guidelines for urban growers	Creation of garden brochure that will be distributed to community garden coordinators, 4 lesson plans that will be shared with Worcester Public School teachers and educators, and introductory guidelines that will be shared via the REC website	Worcester residents have access to appropriate and accessibly formatted information on strategies to address climate change	January-March 2016
4. Distribute materials	Mail brochure to garden coordinators, post lesson plans and introductory guide to REC website	Educational resources ensure sustainability for long term use of ideas and connections generated from this project	April-June 2016
Objective 3: Support four existing gardens to become demonstration sites			
1. Identify gardens that want to participate in project & are a good fit	UGROW Coordinator will meet with all 62 gardens during the fall site visits and use meetings to gauge interest and suitability	Garden partners for the intensive support will have a high level of need and buy-in	September & October 2015
2. Plan infrastructure improvements in collaboration with the Garden Coordinator to address garden needs and strategies to preserve water and soil resources	REC Coordinator and Garden Coordinator will identify 3 key priorities for each gardens and work with expert partners to plan how they can be addressed sustainably. Garden Coordinators will attend carbon sequestration workshops to plan for following harvest	Garden Coordinators will have an understanding of how new infrastructure will increase climate resiliency	January & February
3. UGROW Coordinator will work closely with Garden Coordinators and volunteers to	UGROW coordinator will recruit and supervise volunteers to support in improvement installation and work with garden coordinator to ensure the	Garden coordinators will be empowered to utilize newly learned urban growing methods to	March-May 2016

build and install new infrastructure and create growing/harvest plan for the 2016 season	growing plan for 2016 includes practicing newly learned techniques for carbon sequestration	increase climate resiliency.	
Objective 4: Project Evaluation			
1. Conduct Fall Site Visits	UGROW Coordinator will conduct one-on-one site visits to all Garden Coordinators to identify four gardens to participate in intensive partnership and to collect data on challenges and successes based on program logic model	UGROW Coordinator will gain a deeper understanding of the status of each of the gardens and be able to effectively select partners for demonstration garden project	September/October 2015
2. Implement Pre and Post Workshop Surveys	UGROW Coordinator will implement pre and post surveys for all workshop participants to determine changes in knowledge base and effectiveness of the presenter/workshop material and format	REC will have a base of data to use to gauge the success of the workshops and improve material for future years	November 2015- June 2016
3. Focus Groups with four intensive garden partners	UGROW Coordinator will meet with Garden Coordinator to create plan for fall harvest utilizing new carbon sequestration techniques, develop plan for using the garden as a demonstration site, and solicit feedback from Garden Coordinators on the successes/challenges of the increased level of partnership	Garden Coordinators will feel well supported to continue the work without intensive support and have an opportunity to inform the project's next steps post-grant funding	June/July 2016

V. Organizational Capacity and Programmatic Capability

The REC is well respected in Worcester, Central Massachusetts, and in several federal government agencies for its persistent efforts in working on the environmental health issues that are specific to low-income urban neighborhoods. Our staff, board, members and volunteers have been organizing and coordinating a variety of endeavors since our beginnings in 1971 that work toward environmental justice and sustainability and fair access to clean air and water, nutritious and affordable food, and healthy homes and neighborhoods. In the process, we have built an

array of partnerships and coalitions that create leverage and pool resources, and we have cultivated local leaders to engender grassroots involvement in this work and give structure to community members' efforts. The REC's capability to design and manage large projects such as the Greening our Gardens project proposed here was instrumental in the City of Worcester's decision to subcontract all outreach, education and marketing programs for the HUD-funded lead abatement campaign mentioned earlier. This effort has contributed to dramatic reductions in elevated blood lead levels for children under age 6 in Worcester. Based on this success, WGHHC received U.S. EPA Environmental Merit Awards in both 2010 and 2012 – further testimony to REC's well recognized strength in the area of large-scale programmatic work.

VI. Qualifications of the Project Manager (PM)

The Project Manager for the Greening our Gardens project is REC's UGROW Coordinator, Stacie Brimmage. She is the Coordinator of the UGROW Community & School Gardens Network. She holds a B.A. in Human Ecology from College of the Atlantic. She provides direct support to 62 community gardens, and indirectly supports and promotes the overall gardening community in Worcester. She has worked with the REC for over 4 years. She led a team of youth and community volunteers in establishing a self-guided educational urban garden demonstration site. She has presented at numerous local and national conferences, including the 15th annual Community Food Security Coalition Conference. She is a Worcester native and is committed to increasing food security within the city, and empowering fellow community members to grow their own food.

VII. Past Performance in Reporting on Outputs and Outcomes

REC has significant experience completing and reporting on outputs and outcomes on federally funded projects. The REC uses standard nonprofit accounting procedures to appropriately manage, expend and account for federal funds. Our financial services contractor and Executive Director track all funds via appropriate financial management systems. In addition, the REC undertakes an annual audit. REC has significant experience completing and reporting on federally funded projects. Recent federal grants include a U.S. EPA CARE grant received in 2011 for $100,000 over 2 years, a USDA/NIFA Community Food Project Grant received in 2011 for $300,000 over 3 years; a USDA Farmers Market Promotion Program Grant received in 2012 for $75,000 over 2 years; and 2 subcontracts from the City of Worcester from U.S. HUD Lead Hazard Control and Lead Hazard Reduction Demonstration grants in the amount of $200,000 and $360,000. All federal grants and contracts have been administered appropriately by the REC and we have complied with all reporting requirements.

VIII. Quality Assurance Project Plan (QAPP)

We intend to use existing environmental data and will not need a QAPP if selected for funding.